



County Borough of Stockport.

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# SPECIAL REPORT

ON THE

SUPPLY OF

**Diphtheria Antitoxin**

IN THE BOROUGH,

BY THE

*MEDICAL OFFICER OF HEALTH.*

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STOCKPORT :

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# DIPHTHERIA AND ANTITOXIN SUPPLY.

The Medical Officer of Health submitted the following special report hereon :—

“ In accordance with the suggestion thrown out by Councillor Smeeth to  
 “ this committee I have the honour to now report upon the question of the  
 “ supply of diphtheria antitoxin in the Borough. Diphtheria (under which  
 “ heading one invariably includes cases notified either as diphtheria or as  
 “ membranous croup) is a disease from which this town is practically never  
 “ free, as may be seen from the following figures :—

		Diphtheria.		Membranous croup.		Diphtheria and membranous croup.
“ 1897	.....	13	.....	6	.....	19
“ 1898	.....	12	.....	3	.....	15
“ 1899	.....	7	.....	5	.....	12
“ 1900	.....	20	.....	7	.....	27
“ 1901	.....	20	.....	10	.....	30
“ 1902	.....	25	.....	4	.....	29

“ The extent to which the disease prevails in the town cannot be said to be  
 “ a serious one, but one has always to face the possibility that at some time  
 “ or other the illness may assume an epidemic character and invade a far  
 “ greater number of houses than the average. There is always the possibility  
 “ that any single case may, if proper precautions are not observed, become  
 “ the centre of a widespread epidemic. Each case, therefore, of diphtheria,  
 “ like each case of every other infectious disease, has to be dealt with, not  
 “ for what it is in itself, but for what its possibilities are as regards the  
 “ neighbourhood and the community at large. It is with this in mind that I  
 “ wish to ask your committee’s favourable consideration of the suggestions  
 “ which I have now the pleasure of laying before you.



“ Diphtheria is a disease which consists in the growth of a certain bacillus  
 “ on the throat or in the windpipe of the patient, this bacillus during its  
 “ growth and development leading to two things in particular : (1) the  
 “ formation of a dirty greyish-white false membrane or false skin which by  
 “ extending downwards into the air passages blocks them up and leads to  
 “ death by suffocation ; (2) the formation by the bacillus during its growth of  
 “ virulent poison or toxin derived from the body-material and body-juices,  
 “ which toxin circulates in the blood throughout the whole of the system and  
 “ gives rise to secondary diseases of the nervous system (leading to paralysis  
 “ of certain nerves and certain groups of nerves), of the kidneys, of the heart,  
 “ etc., an acute form of Bright’s disease of the kidneys, to weakness and  
 “ sometimes paralysis of the heart itself, and to other serious and frequently  
 “ fatal complications. The presence of the poison or toxin in the blood of  
 “ the patient leads, although somewhat slowly, to the formation of a natural  
 “ antidote by the blood and by certain other constituents of the human  
 “ system. The extent to which this antidote is formed by the human system  
 “ itself depends of course upon the vitality of that system. If the toxin or  
 “ poison produced by the diphtheria bacillus be large in amount or specially  
 “ potent in character the system may not be able to produce a sufficiently  
 “ strong antidote, or sufficient of it, to counteract the effects of the toxin. So  
 “ long as the toxin remains in the system and is not counteracted so long  
 “ does the disease persist, and so long, of course, does there remain a chance  
 “ of a fatal termination or of serious complications setting in. By a series of  
 “ the most careful and exact experiments scientists have now been able  
 “ to produce an artificial antitoxin or antidote. This antidote is termed  
 “ diphtheria antitoxin or anti-diphtheritic serum. When injected into the  
 “ human system in cases of diphtheria it has precisely the same effect as the  
 “ antitoxin formed in the human system itself, that is to say, it acts as an  
 “ antidote and counteracts the effects of the toxin produced by the growth of  
 “ the diphtheria bacillus. In the case of weakly patients who are suffering  
 “ from a virulent attack of diphtheria, the injection of this artificial anti-  
 “ toxin is of inestimable benefit. Instead of waiting for the system itself to  
 “ slowly manufacture its own antidote to the poison which is circulating in  
 “ it, science has now provided that antidote ready made, and in a state such  
 “ that it will immediately, or almost immediately, counteract the bad effects  
 “ of the toxin. Diphtheria antitoxin has now been used in many thousands  
 “ of cases, and the reports as to its use from every quarter in which it has  
 “ been employed are in the highest degree favourable. The one single fact  
 “ alone that in many places the mortality from diphtheria has been reduced  
 “ from 28 or 30 per cent. down to 13 or 15 per cent. (a reduction of 50 per  
 “ cent.) is sufficient evidence to warrant its universal employment. It is not

“ only employed in practically every single fever hospital in the world, but  
 “ it is extensively used in private practice, and in all cases with the best re-  
 “ sults.

“ Not only has this artificial antitoxin a pronounced curative property, but  
 “ when injected in smaller doses into persons who are, or have been, in  
 “ contact with the infection of the disease, it acts as a preventive or prophylactic,  
 “ and in the majority of cases prevents the infection spreading amongst persons thus treated. I would therefore suggest that whilst  
 “ mainly supplying the serum for curative purposes your committee should  
 “ ask the co-operation of medical men in securing the preventive treatment  
 “ or, as it is termed, the immunisation of persons who have been in contact  
 “ with the infection, for by this means the spread of the disease may be  
 “ very largely controlled. By securing the prompt curative treatment of  
 “ diphtheria cases by means of antitoxin-injection your committee will be  
 “ effecting a double purpose, that is to say you will be conferring a benefit  
 “ not merely upon the individual, but also upon the community. For, in the  
 “ first place, the patient will be restored to health much more rapidly than  
 “ if left to nature herself, and a fatal issue will be prevented in about 50 per  
 “ cent. of the cases. And, in the second place, by enabling physicians to  
 “ cure the disease at a quicker rate, and by preventing a fatal issue, your  
 “ committee will be getting rid of the source of infection more rapidly, and  
 “ will therefore indirectly be preventing the chances of the infection  
 “ spreading.

“ Among municipalities supplying it free of charge to their inhabitants  
 “ may be mentioned Manchester, Liverpool, Blackpool, Bury, Burslem,  
 “ Newcastle-under-Lyme, Royston, Ilkley, Crewe, Stoke-on-Trent, Coventry,  
 “ Leicester, etc. I am indebted to the Medical Officers of Health of these  
 “ various towns for information relating to its municipal use, and partly from  
 “ the information thus supplied and partly from my own experience in the  
 “ use of the substance I am led to make the following recommendation:—

“ That diphtheria antitoxin be supplied free of charge to medical practitioners practising in the Borough for use in cases of diphtheritic disease  
 “ in patients resident in the Borough both for purposes of immunisation and  
 “ cure under the conditions now laid down, and that the Medical Officer of  
 “ Health be authorised to obtain for this purpose and from time to time  
 “ maintain an adequate supply of serum together with the requisite syringes  
 “ for the use of the same.



“ In the conditions which I have deemed it advisable to lay down for the  
 “ free supply of antitoxin there is one in particular to which I should like to  
 “ draw attention, viz., that the serum be not supplied after the sixth day of  
 “ illness unless under the most exceptional circumstances and at the discre-  
 “ tion of your Medical Officer of Health. It has been found that in propor-  
 “ tion as the administration of antitoxin is delayed so does the mortality from  
 “ the cases increase. Taking, for example, the experience of the State of  
 “ Massachusetts, the fatality of those treated during the first two days of  
 “ illness was only 6·6 per cent., whereas the fatality of those in which the  
 “ serum treatment was delayed until the sixth day or later was nearly  
 “ three times as great, or 17·8 per cent. Further than this, the longer the  
 “ infected system is left without artificial antitoxin the more toxin comes to  
 “ be accumulated in the system, and therefore the larger must be the dose of  
 “ the antitoxin administered, and the smaller is the chance of it conferring  
 “ any benefit on the patient. To put it in another manner, a case treated  
 “ with antitoxin within the first two or three days will only require a small  
 “ dose of the antitoxin (costing from 5s. to 6s. or 8s.), and the chances of  
 “ that small amount of antitoxin doing good will be very great. On the  
 “ other hand a case in which the treatment with antitoxin is delayed until  
 “ the sixth day or later will require a large amount of antitoxin (costing from  
 “ 15s. to 25s.), and the chances of that treatment doing good will only be  
 “ very small. In the conditions attached to the use of antitoxin I have  
 “ therefore laid it down that the serum will not be supplied except it can be  
 “ used within the first six days.

“ Probable cost: I have obtained from three different firms their prices  
 “ for the supply of diphtheria antitoxin, and the figures run as follows for  
 “ quantities of 2,000 units :—

“ Messrs. Parke, Davis, and Co., 2s. 8½d.

“ Messrs. Burroughs, Wellcome, and Co., 2s.

“ The Jenner Institute of Preventive Medicine, 2s. 6d.

“ In spite of the slightly increased price my experience leads me to  
 “ recommend the serum made by Messrs. Parke, Davis, and Co.

“ In addition to the supply of serum it would be necessary to keep at least  
 “ two antitoxin syringes for the injection of the material; these would cost  
 “ about 15s. each. The total cost of the whole would therefore not impose  
 “ any serious burden on the department.

“ The following are the conditions which I suggest should be attached to  
“ the gratuitous supply of serum :—

“ 1. The serum will be supplied for hypodermic injection for either cura-  
“ tive or immunising purposes, and medical practitioners will be expected to  
“ use their best endeavours to secure the injection of prophylactic or  
“ immunising doses in those exposed to infection.

“ 2. The serum will only be supplied for use during the first six days of  
“ the disease and not afterwards.

“ 3. In each instance in which it is used medical practitioners will be ex-  
“ pected to take a swab for bacteriological examination as early as possible  
“ in the case (though not necessarily before the serum is injected), and a  
“ further swab at or near the completion of the illness with a view to ascer-  
“ taining the termination and the duration of infectivity of the case.

“ 4. Medical practitioners will be requested to make a return on a printed  
“ form to be supplied, showing the amount of serum employed, result of  
“ illness, etc., together with any remarks likely to be of interest or practical  
“ utility to the Health Department. Information supplied in this manner  
“ will be regarded as confidential.

“ 5. The syringe must be most carefully sterilised before and after use, and  
“ the attention of the Medical Officer of Health must be drawn to any defect  
“ at the time it is discovered or at the time the syringe is returned, so that  
“ it may be at once remedied and the instrument always maintained in a  
“ state fit for use in emergency.

“ 6. The Sanitary Committee do not desire to restrict the use of antitoxin  
“ for immunising purposes in any way whatever, but where it is used solely  
“ for curative purposes they would earnestly ask all medical men to restrict  
“ its free use under the present arrangement to those cases where the patient  
“ is unable to pay for a private supply.

“ 7. That the antidiphtheritic serum is supplied on the distinct under-  
“ standing that this committee accepts no responsibility or liability whatever  
“ for any ill-effects attributable (rightly or wrongly) to its administration.”

(Signed) MEREDITH YOUNG,

M.D., D.P.H., D.S.Sc.,

May, 1903.

Medical Officer of Health.

